Sedalia, Missouri
Water Supply Study
Spring Fork Lake

Sedalia is located in Pettis County Missouri. The lake is approximately 5 miles South of Sedalia on Spring Fork Creek.

Sedalia gets their water from two sources. In year 2001, Sedalia used 990,657,900 gallon of water, 64% came from the lake and the rest from their nine wells.

Spring Fork Lake analysis consisted of using the NRCS's computer program "RESOP". This program analyzes remaining stored water at the end of each month by summing gains and losses.

Two analysis were made:

1. First run was the 2001 demand from the lake for the evaluation period.
2. The lake was analyzed for the optimum daily use without emptying the lake during the evaluation period.

STO-AREA Elevation-Storage and Elevation-Area data were determined from June 26, 2002 survey made by USGS.

Spring Fork Lake

Elevation (feet)	Area (acres)	Storage (ac-ft)	
870.0	0.73	0.54	
872.0	5.09	5.72	
874.0	13.04	23.50	
876.0	22.05	57.51	
878.0	32.46	111.79	
880.0	43.07	186.96	
882.0	53.29	283.20	
884.0	65.92	401.93	
886.0	80.43	548.43	
888.1	97.18	725.32	
890.0	112.43	934.35	
891.6	122.74	1122.21	Water Surface on 4/17/2002
892.0	126.95	1171.26	
892.6	131.24	1249.74	Spillway Elevation

LIMITS Maximum Pool storage 1249 Ac.Ft.
Minimum Pool storage 60 Ac.Ft.

Starting storage was considered full pool.

The drainage area of the lake is 10.98 Square Miles.

GENERAL The adjustment factor of 0.76 to convert from pan evaporation to lake evaporation was applied prior to entering the data for the control word EVAP. As a result a factor of 100.0 was used.

The record period of drought is in the 1950's.
Analysis began in January 1951 and ended December 1959.

SEEPAGE The reservoir seepage varied from 0 seepage near empty to a maximum of 2.25 inches per month at full pool. The seepage rate is a best estimate based on history of the reservoir, soil type, material of the core of the dam and compaction. The material in the dam is compacted earth of clayey soils.

RAINFALL Rainfall data came from the Sedalia, Missouri rain gage for the period 1951 through 1959.

RUNOFF This is the runoff into the lake from its drainage area. Monthly runoff volumes in watershed inches were determined for the Lamine River Gage. Flat Creek Gage is upstream of the Lamine River gage and only has records for the 1960's. These two gages were compared for that time period. The Flat creek gage had 8% more runoff, on an annual basis, than the Lamine River gage. Flat creek drainage has more cropland and the soils have a higher clay content than Spring Fork Creek. As a result the Lamine Gage records seemed to fit the Springfork Lake drainage area runoff. The Lamine River gage runoff was used for this analysis.

In cases where rainfall to runoff values did not appear reasonable, adjustments were made for that month by looking at individual rains and estimating anticedent moisture then, adjusting runoff based on NRCS's runoff curve numbers.

EVAP. Pan evaporation at the Lakeside gaging station was used as a base because it has data for year around evaporation. All other stations only measure data between April through November. Lakeside data was updated during these months with gage data from stations at New Franklin, and Columbia. Depending on the latest data for the station nearest to Sedalia.

DEMAND This was determined by city records. Sedalia used a total of 990,657,900 gallons during 2001. Of this 633,275,000 gallons came from Spring Fork Lake and the rest came from their 9 wells. The volume of water used for this lake analysis was 1.735 million gallons per day.

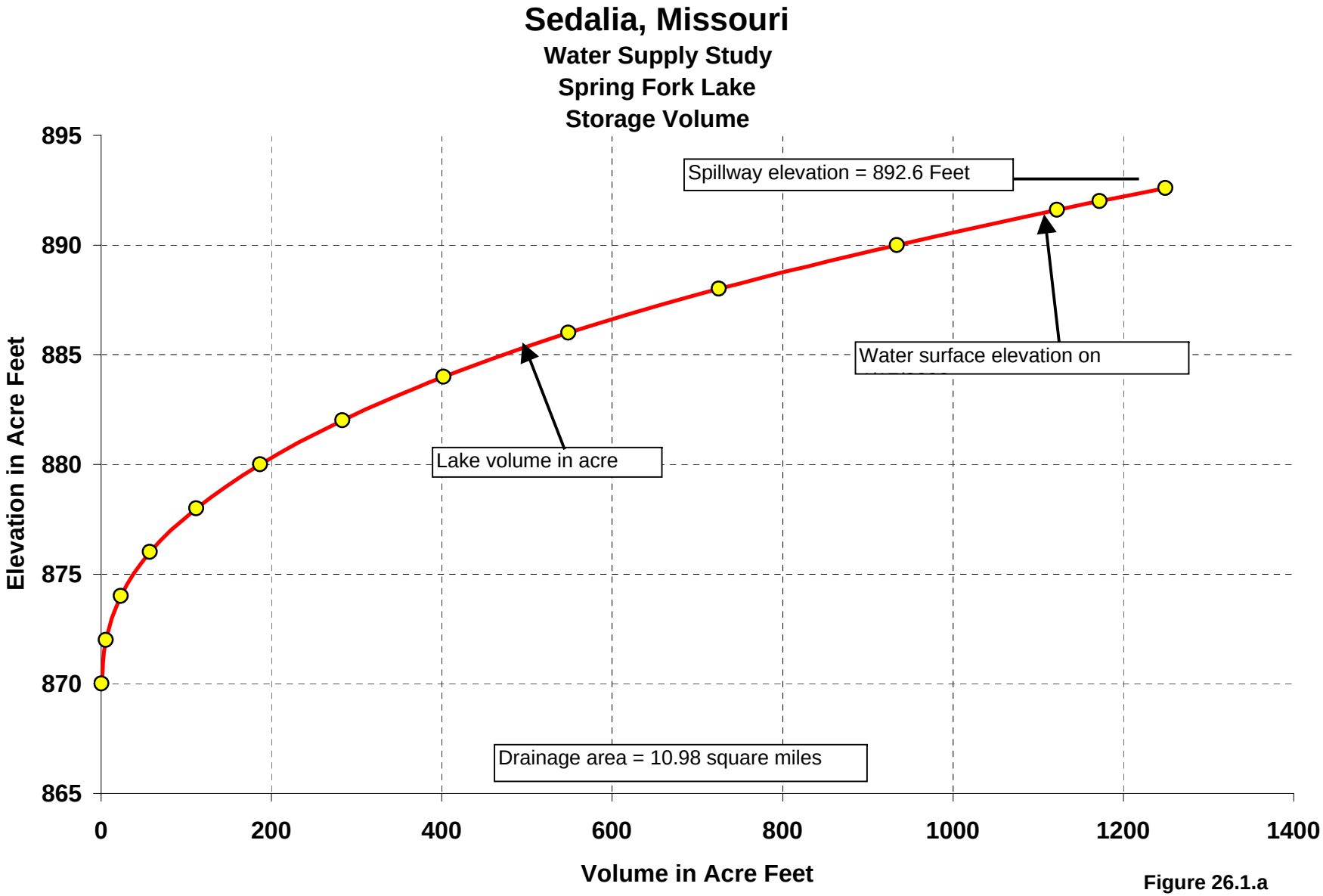

Sedalia, Missouri
Water Supply Study
Spring Fork Lake
Storage Volume
Spillway elevation = 892.6 Feet
Water surface elevation on
Lake volume in acre
Drainage area = 10.98 square miles
Elevation in Acre Feet
Volume in Acre Feet
895
890
885
880
875
870
865
0
200
400
600
800
1000
1200
1400

Figure 26.1.a

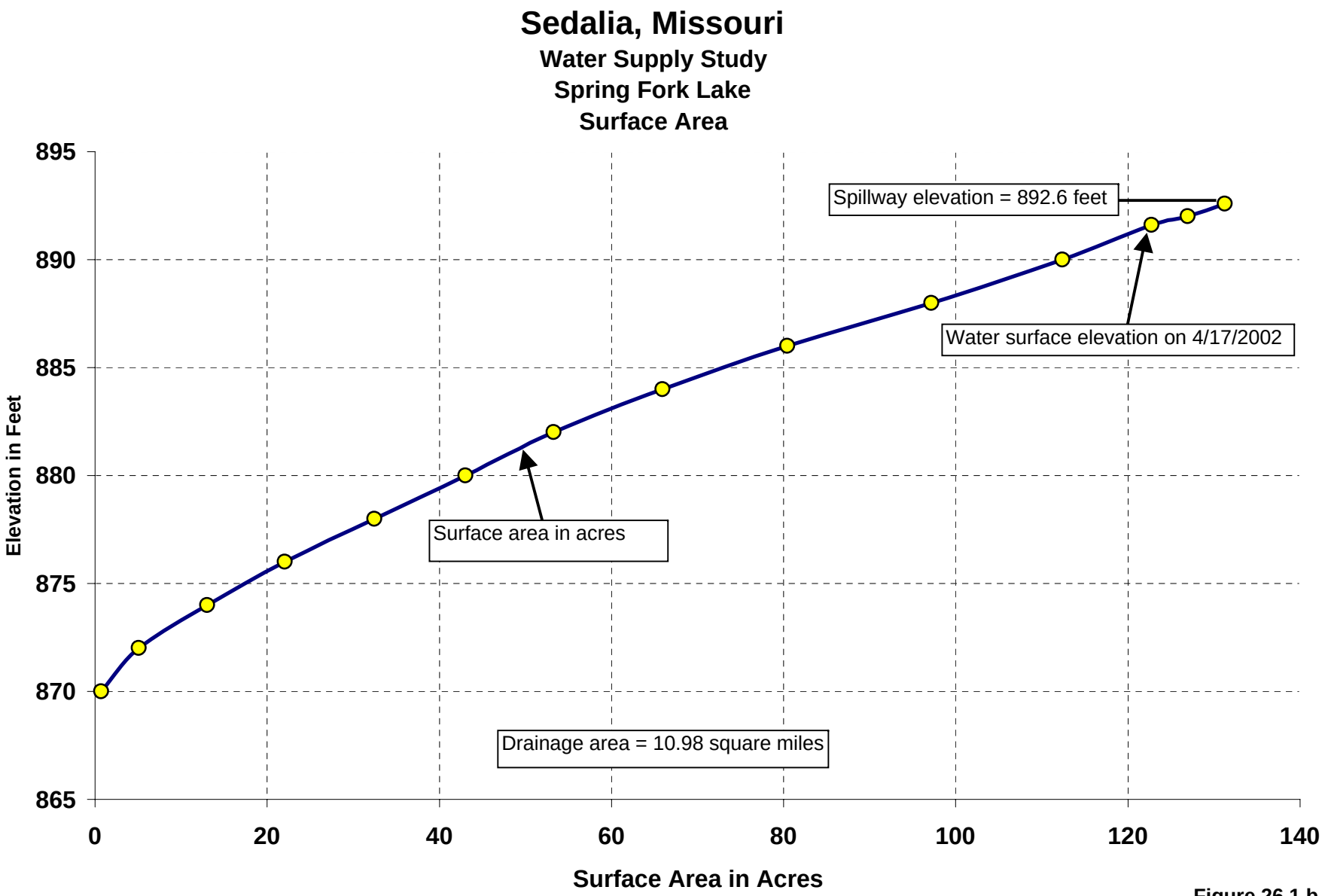

Sedalia, Missouri
Water Supply Study
Spring Fork Lake
Surface Area
Elevation in Feet
895
890
885
880
875
870
865
0
20
40
60
80
100
120
140
Surface Area in Acres
Spillway elevation = 892.6 feet
Water surface elevation on 4/17/2002
Surface area in acres
Drainage area = 10.98 square miles

Figure 26.1.b

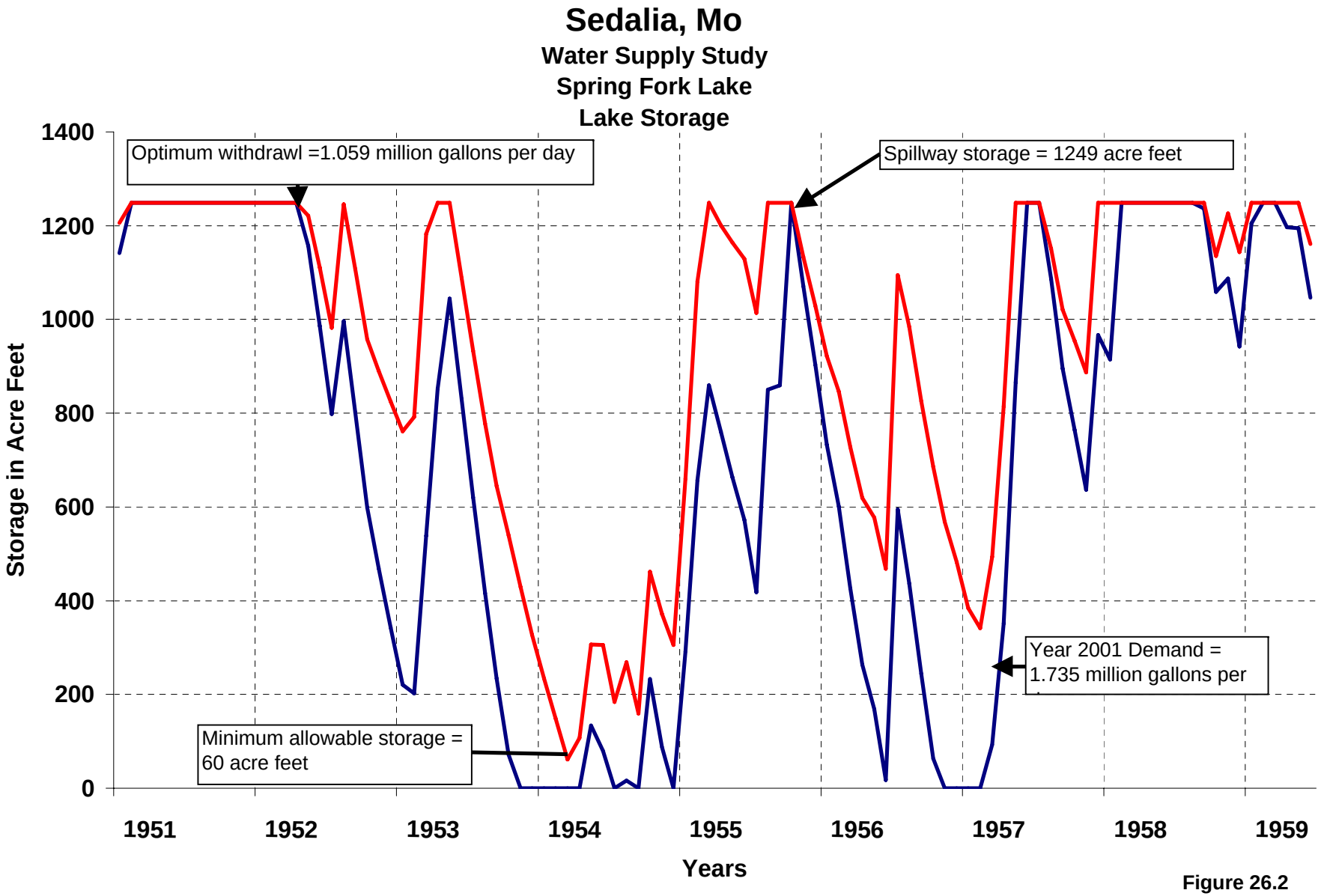

Sedalia, Mo
Water Supply Study
Spring Fork Lake
Lake Storage
Optimum withdrawl =1.059 million gallons per day
Spillway storage = 1249 acre feet
Year 2001 Demand =
1.735 million gallons per
Minimum allowable storage =
60 acre feet
Storage in Acre Feet
1400
1200
1000
800
600
400
200
0
1951
1952
1953
1954
1955
1956
1957
1958
1959
Years

Figure 26.2

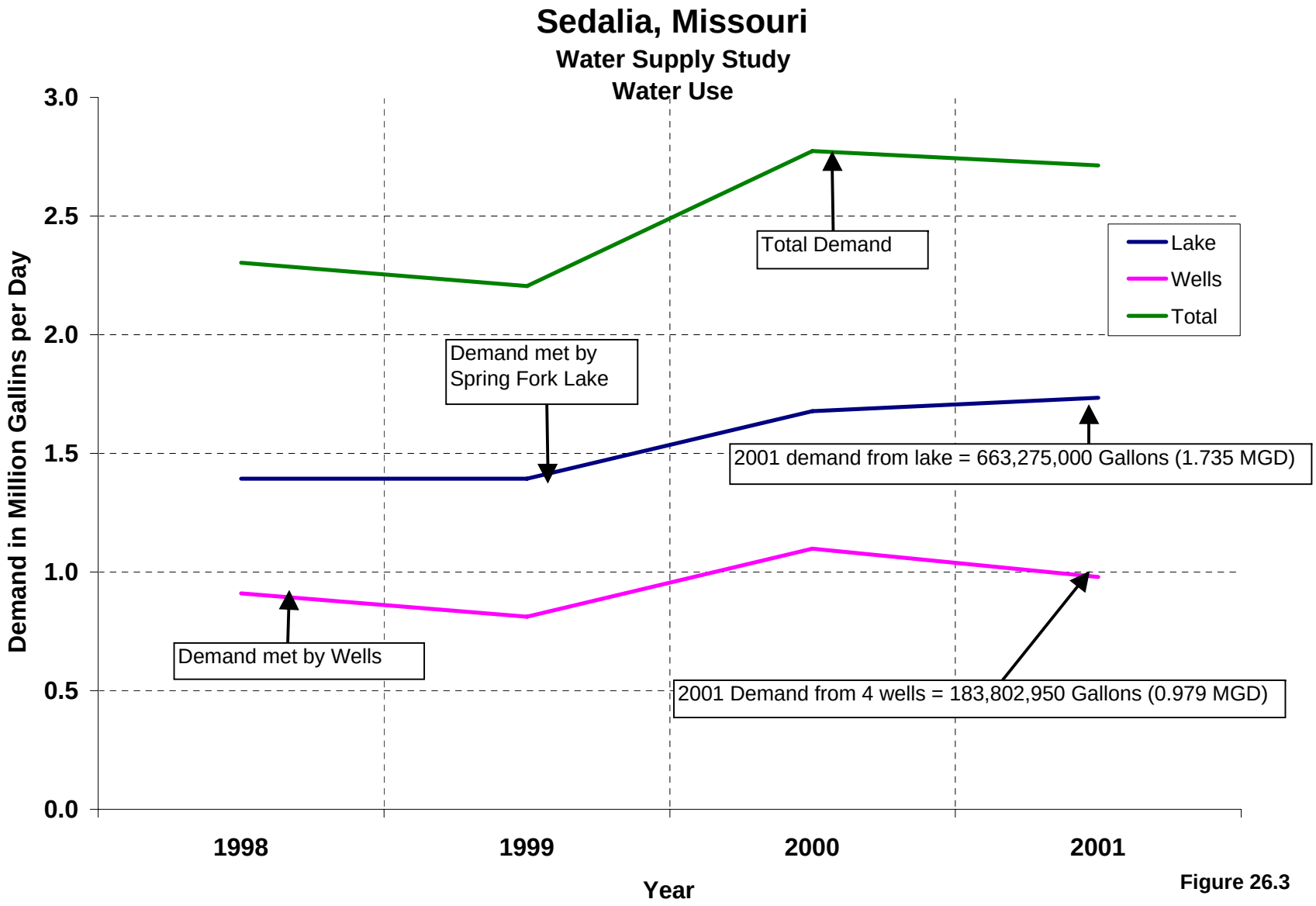

Sedalia, Missouri
Water Supply Study
Water Use
Demand in Million Gallins per Day
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1998
1999
2000
2001
Year
Total Demand
Lake
Wells
Total
Demand met by
Spring Fork Lake
2001 demand from lake = 663,275,000 Gallons (1.735 MGD)
Demand met by Wells
2001 Demand from 4 wells = 183,802,950 Gallons (0.979 MGD)

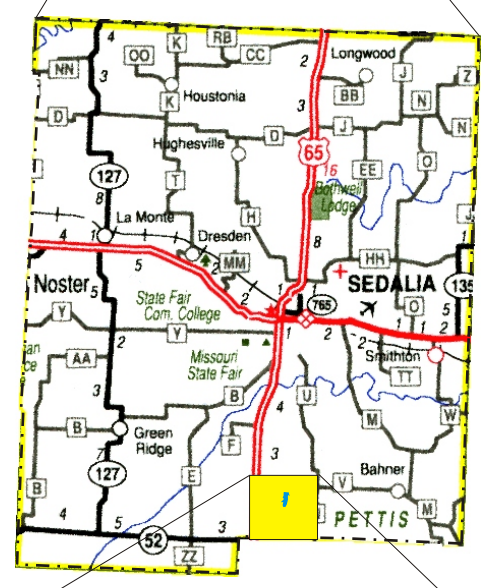
Figure 26.3

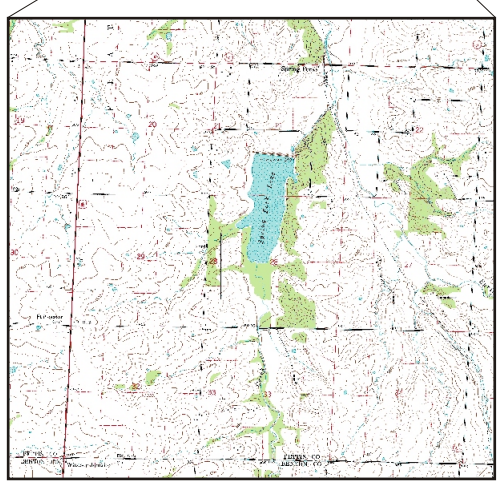
SPRINGFORK LAKE

Elevation (feet)	Area (acres)	Volume (acre-ft)
870.0	0.7	0.5
872.0	5.1	5.7
874.0	13.0	23.5
876.0	22.0	57.5
878.0	32.5	111.8
880.0	43.1	187.0
882.0	53.3	283.2
884.0	65.9	401.9
886.0	80.4	548.4
888.0	97.2	725.3
890.0	112.4	934.3
891.6	122.7	1,122.2
892.0	126.9	1,172.3
892.6	131.2	1,249.7

Table 15. Lake elevations and respective surface areas and volumes. Spillway elevation is 892.6 feet.

LOCATION MAP





EXPLANATION

—890— BATHYMETRIC CONTOUR—Shows altitude of the reservoir bottom. Contour interval 2 feet. Datum is sea level

—892— WATER SURFACE—Shows approximate elevation of water surface, April 17, 2002 (actual is 891.6 feet, table 15). Datum is sea level.

⊠ U. S. GEOLOGICAL SURVEY REFERENCE MARKER—Chiseled Square located 30 feet west of concrete spillway. Elevation 892.6 feet. Datum is sea level.

USGS science for a changing world

Figure 26.4 Bathymetric map and area/volume table of Springfork Lake near Sedalia, Missouri.